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CAPITAL STRUCTURE OF NON-FARM ENTERPRISES IN THE GAMBIA

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Abstract

The focus of this study is the capital structure of non-farm manufacturing enterprises in low income countries. The study examined the importance of different sources of financing, internal and external, in the capital structure of the firm and the factors explaining entrepreneurial behavior in using different financial contracts. The capital structure was modeled by considering a one-period world within a deterministic approach. A set of testable hypotheses derived from this model was applied to a sample of 153 micro, small and medium scale manufacturing enterprises in The Gambia. The findings of this study support the hypotheses that the characteristics of the enterprise, attributes of the entrepreneur, rates of return, interest rates, transaction costs of alternative sources of financing and the respective shares of these securities simultaneously determine the capital structure of the enterprise.

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I. INTRODUCTION

The limited role of manufacturing enterprises in many Sub-Saharan African countries implies a need to examine the determinants affecting their operations and evolution. It is speculated that over 10 to 30 years, only a few countries will host large scale industries that will provide employment to wage laborers (World Bank). However, manufacturing subsectors, such as food processing, tailoring and metal working among others, can provide ample opportunities for small and medium scale enterprises. Consequently, it is important to have a better understanding of the factors affecting operations in the manufacturing sector which will be an important source of employment.

Despite numerous projects and policies initiated to assist micro, small and medium scale manufacturing enterprises (SMEs)[2] in low income countries (LICs), little is known about the impact these efforts have on enterprise operations and growth in these countries. The persistent question is to what extent do credit programs assist the operations and evolution of SMEs? The supply

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[2] The definition of micro, small and medium scale enterprises based on the number of employees varies in the literature (Liedholm and Parker). Some of these variations are a result of subjectivity as well as country specification.

leading approach to the development of SMEs has led researchers to be wary of its consequences (Adams and Von Pischke). Enterprise development programs typically provide loans and/or technical assistance but neglect to assess the entrepreneur's effective demand for alternative financial services. This problem persists because there is a lack of understanding and recognition of the unexplored issue of capital structure of these enterprises.

The focus of this study is the capital structure of non-farm manufacturing enterprises in LICs. The examination of the entrepreneur's choice among the sources of financing, internal and external, will shed some light on firm level operations in financial markets. This study draws upon the modern finance literature where the issue of the capital structure of firms is discussed within two schools of thought, the optimal leverage theory and the pecking order theory. Both frameworks address the determinants of capital structure within developed financial markets and often assume perfect capital markets. It is critical, however, that we recognize the conditions of developing financial markets prevailing in many LICs. Thus, the study presents a model which addresses the capital structure of SMEs in developing economies, derives a set of testable hypotheses and presents empirical implications based on a study of the enterprise sector in The Gambia.

II. CAPITAL STRUCTURE DETERMINANTS IN DEVELOPED AND DEVELOPING CAPITAL MARKETS

Several theoretical arguments have been advanced during the past two decades, mostly in relation to the theory of optimal leverage, to explain the capital structure of business firms in developed economies. A more recent line of thought addresses the capital structure puzzle by advancing the pecking order theory. Empirical testings of these theories have been limited

exclusively to industrial economies with developed capital markets. It is surprising that, thus far, no theoretical framework has been developed to analyze the capital structure of SMEs in LICs. There exists a body of literature, however, which provides descriptions of the various sources of finance entrepreneurs generally draw upon in LICs. The developed capital market theories and the descriptive studies in LICs will be briefly reexamined to introduce the framework for this study.

The firm's optimal debt to asset ratio is viewed as that which would minimize the firm's composite cost of capital (Wijst). In addition to the direct costs of borrowing, the indirect costs of borrowing have been associated with taxes, bankruptcy costs, agency costs and signalling effects (Harris and Raviv). Many of the hypothetical assumptions upon which these models are based include costless, competitive and complete capital markets (Stiglitz; Wijst). These assumptions imply that there are no transactions costs, there is complete information and financial assets are costlessly and infinitely divisible. The reasoning behind these assumptions, often imposed based upon the developed capital markets, does not hold in developing capital markets in LICs. The pecking order theory, however, does not assume a perfect capital market structure but rather underscores some important imperfections in financial markets such as asymmetric information and transaction costs as well as the costs of financial distress.

The pecking order theory is not concerned with an optimal debt level of the firm. Many of the asymmetric information problems, such as adverse selection and moral hazard, which result in signalling effects and agency costs are suggested to induce additional costs when using external sources of finance. This implies that firms are inclined to use a sequential rank order in the sources of finance. "Safety first" (i.e. not losing ownership control of the firm) is a principle that has been used to rank the preferred sources of financing that the firm draws upon in priority order (Cuevas;

Myers). It is argued that firms choose to finance investments first from internally generated funds since this represents the safest source of financing. External sources of financing, therefore, are ranked second. In the case where external finance is required the safest sources are also drawn upon first. External finance may be divided into informal and formal sources. Informal sources include loans from relatives and friends, investments by relatives and friends, and trade credit from both suppliers and customers. Formal sources are further divided into financial intermediaries and public markets. Financial intermediaries include bank and non-bank financial institutions as well as venture capital companies. Public markets consist of bond issues and stock issues. These formal sources, however, are less frequently available in developing than in developed capital markets.

Another body of literature describes the sources of finance for micro, small and medium scale enterprises in low income countries through an empirical framework (Cortes et al.; McLeod; Kilby et al.). In general, most of these studies identify the prevalent sources of finance microentrepreneurs use and document the frequently reported constraint: "limited access to credit". An intriguing counter argument put forth by McLeod confronts the popular belief that finance is the most binding constraint encountered by small scale enterprises (McLeod). This argument is based on empirical results which show that ample financing options, both internal and external, are providing competitive sources of finance and, thus, more competition for lenders and in particular for banks. The argument also highlights, without rigorous analysis, that self-financing is the most commonly used source of finance by choice and not by default, i.e. because of denied access to other sources. Thus, the author suggests that: "it seems more plausible to argue that lack of entrepreneurial ability makes access to finance difficult, rather than that lack of access to finance holds back entrepreneurship." (McLeod, 1991, pp. 262-263).

III. THE THEORETICAL MODEL

The theoretical framework describing the capital structure of the enterprise may be modeled by considering a one-period world where entrepreneurs possess a certain amount of wealth which is to be allocated among different assets (Baydas). The starting point of the analysis considers an entrepreneur who knows with certainty the production outcome and all other variables in the model. The entrepreneur operates a manufacturing business where output is produced using a stock of physical capital (K) and a flow of variable inputs. The vector of variable inputs used in production makes up the operating costs which add up to total expenditure (T) over the production period. Moreover, entrepreneurial or managerial abilities (A) are considered as an indirect input in the production function. Proxy variables, such as the characteristics of the entrepreneur and enterprise, specified in table 1, capture the effects of entrepreneurial abilities. The price of output (P) is exogenous and the firm's revenue is specified as: $Y = Y(K, T, A, P)$.

The entrepreneur augments initial wealth, or equity, (W) by drawing on external sources of financing. The different sources of external finance are non-commercial informal loans (IL) from fellow entrepreneurs, friends and relatives, trade finance from suppliers and customers (TL), and formal loans (FL) from commercial banks and other non-bank institutions such as microenterprise programs. The entrepreneur allocates the resources available to the firm among financial assets (FA) and physical assets (K). The various forms of financial assets are: cash holdings (C), informal holdings with moneykeepers and rotating savings and credit associations (IH), and formal deposits with commercial banks (D). Over the production period, the entrepreneur draws upon the alternative financial assets and liabilities to finance the cost of inputs. The returns (r), interest rates (i) and transaction costs (t) associated with these assets and liabilities are respectively: (r_i), (i_j) and $(t_{i,j})$,

where (i= C, IH, D; j= IL, TL, FL). Table 1 presents a summary of the abbreviated variable names and their definitions.

Following the standard microeconomic theory of the firm, the problem can be specified as a maximization of retained earnings in the objective function with respect to the decision variables (K, T, C, IH, D, IL, TL, FL) subject to a balance sheet constraint and an expenditure flow identity. Differentiating with respect to the decision variables yields the first order conditions. Solving the first order condition equations for the proportions of the different sources of financing (C/T), (IH/T), (D/T), (IL/T), (TL/T) and (FL/T) for a given (T) yields the following simultaneous equations system:

$$(\frac{C}{T})=\beta_{10}+\beta_{11}(t_C)+\beta_{12}(r_C)+\beta_{13}(i_{IL})+\beta_{14}(t_{IL})+\beta_{15}(\frac{IL}{T})+\beta_{16}(Y_K) \quad \textbf{(1)}$$

$$(\frac{IL}{T})=\beta_{20}+\beta_{21}(t_{IL})+\beta_{22}(i_{IL})+\beta_{23}(r_{IH})+\beta_{24}(t_{IH})+\beta_{25}(\frac{IH}{T})+\beta_{26}(Y_K) \quad \textbf{(2)}$$

$$(\frac{IH}{T})=\beta_{30}+\beta_{31}(t_{IH})+\beta_{32}(r_{IH})+\beta_{33}(i_{TL})+\beta_{34}(t_{TL})+\beta_{35}(\frac{TL}{T})+\beta_{36}(Y_K) \quad \textbf{(3)}$$

$$(\frac{TL}{T})=\beta_{40}+\beta_{41}(t_{TL})+\beta_{42}(i_{TL})+\beta_{43}(r_D)+\beta_{44}(t_D)+\beta_{45}(\frac{D}{T})+\beta_{46}(Y_K) \quad \textbf{(4)}$$

$$(\frac{D}{T})=\beta_{50}+\beta_{51}(t_D)+\beta_{52}(r_D)+\beta_{53}(i_{FL})+\beta_{54}(t_{FL})+\beta_{55}(\frac{FL}{T})+\beta_{56}(Y_K) \quad \textbf{(5)}$$

IV. DATA FROM THE ENTERPRISE SURVEY IN THE GAMBIA

To examine the capital structure in the enterprise sector a survey of 153 micro, small and medium scale manufacturing enterprises was carried out in March and April of 1992 in The Gambia. The enterprise survey covered the four principal subsectors in the manufacturing sector in the country. These consisted of bakeries, both traditional and modern, metal workshops, tailoring workshops and tie-dye producers. Roughly, 40 enterprises were surveyed in each subsector. These enterprises were operated primarily by owners (84 percent) where the average value of physical assets was D128,727 (US$ 14,464). This value, however, varies by subsector. The average number of employees in the surveyed enterprises was 5 persons; however, the range of employees was from 0 to 26 workers. Thus, the sample includes micro, small and a few medium scale enterprises. With respect to the age of these businesses, the average business has been in operation for 10 years and the average business experience for an entrepreneur before starting her/his business was 5 years.

Various sources of funding and savings channels were used by entrepreneurs. They fell into informal and formal networks. The informal channels that were used by the entrepreneurs in The Gambia include family and friends, supplier credit, customer advances, Osusu groups (Rotating Credit and Savings Associations, or RoSCAs), and moneykeepers. The formal channels included commercial banks and a microenterprise program. Compared to the wide array of informal financial channels, the formal channels were limited in the role they have played as financial intermediaries.

V. ECONOMETRIC METHODS AND ANALYSIS

The observed amounts of financial assets and liabilities used to finance the operating costs for a given period are jointly determined in a structural system of simultaneous equations (eqs. 1-5).

Considering the array of different financing sources that an entrepreneur may use to fund total expenditures over inputs presents some zero and positive amounts for the variables (C/T, IL/T, IH/T, SL/T, D/T, FL/T) on the left hand side (LHS) of the equations in the model. The sequential two-stage estimation technique used in this study involves, first, estimating the reduced form equations using the standard tobit model for equations with limited LHS variables or least squares for unconstrained LHS variables, as appropriate for each reduced form equation. Second, we obtain the predicted values of the endogenous variables from step 1, and insert the predictors for the endogenous variables on the RHS of the equations in the structural model. Third, we estimate the structural equations using tobit maximum likelihood technique or least squares to generate the results of the model (Table 2). This methodology is similar to that of Nelson and Olson's model (1978), reviewed by Amemiya (1984) under a type 4 tobit model, which generates consistent and asymptotically normal estimates.

First, the results of the model with respect to the characteristics of the enterprise lend partial support to both the pecking order theory and the asymmetric information and credit rationing theory[3]. On the one hand, the positive relationship between formal loans and the value of assets as indicated from the long-term multiplier effect supports the asymmetric information and credit rationing theory[4]. On the other hand, the long-term negative relationship between formal loans and the size of the firm, and the positive relationship between trade loans and profitability of the firm

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[3] Credit rationing occurs when a lender grants loans to applicants identified as creditworthy while granting loans smaller than demanded to some less secure applicants and completely rejecting others (Stiglitz and Weiss).

[4] The multiplier effect is generated from the first-stage estimation of the reduced form equations. Given the space limitations, the statistical results could not be presented.

support the pecking order theory. Thus, the results indicate that both the pecking order and the credit rationing theories are supported by different enterprise characteristics in The Gambia.

Second, the subsector of operation indicates significant differences in the sources of finance enterprises utilize. Trade credit is an important source of finance for enterprises which manufacture custom-tailored products. Moreover, informal and formal deposit holdings are significant sources of finance in the traditionally female profession of tailoring. However, entrepreneurs operating in the male dominated professions of bakeries and metal work deposit largely with informal moneykeepers rather than with formal institutions. The subsector of operation does not seem to affect the entrepreneurs' use of formal loans. Thus, subsector implications are in line with the pecking order theory which relies on the safety first principle.

Third, characteristics of the entrepreneur in terms of previous experience indicate that more experienced entrepreneurs utilize fewer formal loans than entrepreneurs with less previous experience. Moreover, higher education and increases in previous experience are associated with increases in formal deposits. These implications indicate more risk averse behavior and, thus, are in agreement with the pecking order theory. Gender of the entrepreneur indicates that female entrepreneurs hold more informal and formal savings than their male counterparts. This result also implies that female entrepreneurs exhibit a more risk averse behavior, in line with the pecking order theory.

Fourth, rates of return, interest rates and transaction costs are significantly associated with their respective sources of financing indicating the importance of prices in determining the capital structure of SMEs. Fifth, and finally, the negative relationship between trade loans and deposit holdings supports the pecking order theory; however, the positive relationship between deposit

holdings and formal loans supports the asymmetric information and credit rationing theory. Thus, the findings of this study confirm the hypotheses that the characteristics of the enterprise, attributes of the entrepreneur, rates of return, interest rates, transaction costs of the financial instruments and the shares of the assets and liabilities entrepreneurs use to finance their operations simultaneously determine the capital structure of SMEs.

VI. CONCLUSIONS

The relevance of the pecking order theory raises serious questions about the cost effectiveness of allocating large amounts of resources into expensive microenterprise programs in LICs. Trade liberalization policies may have a more positive impact on increasing competition among input suppliers and open new channels for sale of output in expanded markets. Intervention schemes should focus on enhancing vertical linkages and output marketing channels that in turn would generate a larger demand for microenterprise products. Financial programs and policies should further stress savings mobilization and induce more competition in financial markets between formal and informal intermediaries.

Table 1. Definition of Variables in the Simultaneous Equations Model of the Different Sources of Financing Shares Relative to Total Expenditure over Inputs

Variables	Definition
Exogenous Variables	
K	Physical assets (Dalasis);
P	Total Value of output (Dalasis);
T	Total Cost of inputs (Dalasis);
EMPLY	Number of employees;
YRS	Number of years the enterprise has been in operation;
BKR	Dummy variable = 1 for bakeries;
MTL	Dummy variable = 1 for metal workshops;
TLR	Dummy variable = 1 for tailoring workshops;
AGE	Age of the entrepreneur (Years);
EDUC	Educational level of the entrepreneur;
XEXP	Number of years of previous experience in line of business;
GENDER	Dummy variable = 1 for male entrepreneurs;
RC	Rate of return on cash holdings;
IIL	Interest rate on informal loans;
RIH	Rate of return on informal holdings;
ITL	Interest rate on trade loans;
RD	Rate of return on deposits;
IFL	Interest rate on formal loans;
TCC	Transaction costs associated with cash holdings (Km);
TCIL	Transaction costs associated with informal loans (Km);
TCIH	Transaction costs associated with informal holdings (Km);
TCTL	Transaction costs associated with trade loans (Dalasis);
TCD	Transaction costs associated with deposits (Km);
TCFL	Transaction costs associated with formal loans (Km);
Endogenous Variables	
CT	Cash holdings relative to total cost of inputs;
ILT	Informal loans relative to total cost of inputs;
IHT	Informal holdings relative to total cost of inputs;
TLT	Trade loans relative to total cost of inputs;
DT	Deposits relative to total cost of inputs;
FLT	Formal loans relative to total cost of inputs.

Table 2. Second-Stage Structural Equation Estimation of the Different Sources of Financing Relative to Total Expenditure (Linear-Log Functional Form)

Variables	OLS (CT)	TOBIT (ILT)	TOBIT (IHT)	TOBIT (TL/T)	TOBIT (DT)
Const.	1.303	1.268	3.415	-0.774	-3.162
	(1.142)	(1.681)	(2.753)	(2.824)	(3.668)
LK	-0.4E-01	0.080	-0.503 ***	0.025	-0.123
	(0.5E-01)	(0.088)	(0.168)	(0.102)	(0.102)
LPT	-0.083	0.117	0.728 *	0.940 ***	0.282
	(0.158)	(0.244)	(0.465)	(0.236)	(0.276)
LEMPLY	-0.073	-0.357 *	-0.360	0.333 *	0.379 *
	(0.161)	(0.199)	(0.344)	(0.188)	(0.243)
LYRS	0.027	0.230 *	0.095	-0.029	0.060
	(0.084)	(0.122)	(0.178)	(0.117)	(0.145)
BKR	-0.324	-0.485	4.740 ***	0.180	0.256
	(0.284)	(0.485)	(0.942)	(0.483)	(0.719)
MTL	0.203	-0.313	3.919 ***	1.430 ***	0.372
	(0.239)	(0.391)	(1.088)	(0.379)	(0.514)
TLR	0.218	0.322	1.188 *	0.882 *	0.020
	(0.266)	(0.379)	(0.674)	(0.465)	(0.468)
LAGE	0.051	-0.620	-1.049	-0.145	-0.162
	(0.361)	(0.489)	(0.713)	(0.473)	(0.629)
LEDUC	0.101	0.229 **	0.039	-0.053	0.304 **
	(0.086)	(0.112)	(0.183)	(0.105)	(0.128)
LXEXP	-0.093	-0.163	0.013	0.105	0.290 *
	(0.087)	(0.130)	(0.183)	(0.129)	(0.168)
GENDER	-0.183	0.462	-1.084 **	0.443	-0.798 **
	(0.224)	(0.333)	(0.497)	(0.289)	(0.354)
LRC	-0.9E-02				
	(0.126)				
LIIL	-0.054	0.436			
	(0.227)	(0.295)			
LRIH		-0.058	0.281 ***		
		(0.061)	(0.097)		
LITL			-0.315	0.679 ***	
			(0.463)	(0.241)	
LRD				0.306	1.829 **
				(0.929)	(0.885)
LIFL					-0.662
					(0.457)
LTCC	0.038				
	(0.066)				
LTCIL	0.018	0.835 ***			
	(0.066)	(0.292)			
LTCIH		-0.5E-02	1.382 ***		
		(0.232)	(0.226)		
LTCTL			-0.186	0.4E-02	
			(0.160)	(0.069)	
LTCD				-0.115	0.323 ***
				(0.076)	(0.108)
LTCFL					-0.231 **
					(0.118)
ILHAT	-6.441				
	(10.17)				
IHHAT		0.106			
		(0.097)			
TLHAT			0.961		
			(1.038)		
DHAT				-1.162 **	
				(0.564)	
FLHAT					5.279 ***
					(1.351)
R-SQR	0.18				
LH		138.25	-109.78	-99.90	-54.75

Asymptotic Standard Errors are reported in parentheses.
***, ** & * represent significance at 1, 5 and 10 percent levels, respectively.

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